

Application No.: 10/723653
Docket No.: AD6924USNA

Page 2 of 6

REMARKS

Rejections

35 USC 103(a)

Claims 1-5, 8 and 9 were rejected under this provision as obvious over U.S. Pat. No. 5,237,008 to Kosinski ["Kosinski"] in view of Kuduo (US 6,930,145). The Applicants thank the Examiner for the clarification of the new grounds for rejection by telephone, on September 14, 2006. The Examiner states that one would have been motivated to modify Kosinski in order to improve the impact resistance, heat stability, and antistatic properties as taught in Kuduo.

The Examiner maintains the rejection is appropriate in view of the newly cited reference. However, the Applicants respectfully disagree with the new grounds of rejection. The Applicants note that one of the primary objectives of the present invention is to obtain a polyoxymethylene (POM) composition having increased surface adhesion in order to improve adhesion to other surfaces (see, for example, page 1, lines 27-31).

The Examiner relies on Kosinski, even though Kosinski teaches the use of LDPE, which is not a non-acetal polymer of the presently claimed composition. Applicants note that the Examiner's consideration of LDPE as "at least one additional non-acetal polymer of claim 5" in paragraph 7 of the present office action is not understood in view of the limitations to Claim 1. Claim 1 discloses a closed list of non-acetal polymers included in the scope of the claimed invention, and LDPE is not listed. Since Claim 5 is dependent from Claim 1, it is not understood why the Examiner considers LDPE a claimed "non-acetal polymer" in spite of the limitation of Claim 1. We respectfully request that this ground of rejection be withdrawn or, alternatively, request further clarification.

In any event, the Applicants respectfully contend that there is no motivation for one of ordinary skill to combine the references in the manner suggested by the Examiner. As noted hereinabove, one of the primary objectives of the claimed invention is to provide an article having improved surface adhesion. The Applicants respectfully disagree with the Examiner's suggestion, that is, that improving impact resistance, antistatic properties, or heat resistance would provide the motivation to combine the references. To prove obviousness, it is incumbent on the Examiner to show that one of ordinary skill in the art would be motivated to combine the references in the manner suggested by the Examiner, and that such motivation to combine should suggest the solution devised by the Applicants such that one looking to solve the same problems contemplated by the Applicants would be likely to combine the references in the same manner as the Examiner. The improvements suggested as motivation to combine were not motivating factors in the presently claimed invention. The Applicants contend, therefore, that one of ordinary skill looking to solve problems of surface adhesion would not

Application No.: 10/723653
Docket No.: AD6924USNA

Page 3 of 6

look to the cited references, motivated by the desire to improve impact resistance, heat resistance, and antistatic properties of the POM.

The discovery described in the present application is surprising, and therefore non-obvious. It is generally known that POM compositions do not have good adhesive properties. There is a high level of crystallinity in a POM polymer, and therefore POM exhibits lesser adhesion than amorphous or liquid polymers that are better able to swell a polymer surface and cause entanglement at the interfacial surface. It is also known that POM compositions can be readily degraded and are therefore compatible only with a limited range of materials. Because of the limited range of materials that can be compatible with POM without causing degradation there are few materials that can be combined with POM and improve adhesion as described in the present application. The presently claimed invention is not obvious over the cited references because the references do not teach or suggest that a POM composition as claimed would be (a) stable and (b) have improved surface adhesion. There is nothing in either reference to suggest that LDPE would improve surface adhesion in an article as claimed by the Applicants. The references are silent with respect to surface adhesion. Any suggestion about the desirability of improving surface adhesion comes from the Applicants' teachings rather than from the references themselves.

Given what is known with regard to the properties of POM, it would be reasonable to object to the contention that the combination of references teach the Applicants' claimed invention because they do not teach that the combination suggested by the Examiner would be stable, regardless any supposed improvement in adhesion.

With respect to the Examiner's reliance on the acid modification of a polyolefin component to improve compatibility. The reference to adhesion in Kuduo is only in regard to effect of the level of acid in the acid-modified component on the adhesion to the polyamide of the composition described therein. This does not imply or suggest an improvement of surface adhesion. The present invention teaches methods of improving surface adhesion. In the present application the Applicants discuss how surface adhesion is improved in the present invention by including a component that has a melt viscosity that is lower than the melt viscosity of the POM. As such the lower viscosity component moves towards the area of high shear during processes such as injection molding, i.e., towards the walls of the mold (the surface of the POM article). Acid modification of a polyolefin would be expected to increase the melt viscosity of the polyolefin and the acid-modified component would move away from the area of high shear (away from the POM surface). Therefore any teaching or suggestion for incorporating LDPE (or some other polyolefin) and acid-modifying the polyolefin is away from the presently claimed invention since the modified polyolefin would be expected to migrate away from the POM surface, where the improvement to adhesion is desired.

The Examiner suggests that a polyolefin can be acid-modified as taught in Kuduo to improve adhesion to the polyamide portion. The Applicants again note that the acid-modified polyolefin would react with the polyamide and the melt viscosity of the acid-modified

Application No.: 10/723653
Docket No.: AD6924USNA

Page 4 of 6

polyolefin would increase, again causing the modified component to migrate away from the surface. It would defeat the purpose of the claimed invention to add a component that acts contrary to the Applicants' intended result. The Applicants again contend respectfully that Kuduo does not teach improved surface adhesion as the Applicants do. In fact, one embodiment of Kuduo is a lubricant for mold release, and therefore the teaching is away from the present invention.

Thus, the Applicants contend that: (1) it would not be obvious to modify Kosinski to incorporate the teachings of Kuduo when one of ordinary skill is looking to improve adhesion in an article comprising POM; and (2) even if obvious to combine, the references do not provide one of ordinary skill in the art the invention claimed by the Applicants.

Claims 1, 5, 8, 9 and 11 were also rejected under this provision as obvious over Jap. App. Pub. No. 2002192663A ["Polyplastics"] in view of Kuduo. Paragraph 8 of the Office Action states that Polyplastics teaches an intermediate layer with a layer of polyolefin and a layer of polyoxymethylene on either side of it, with each layer having a specific ratio of polyolefin to the polyoxymethylene. The Examiner uses similar reasoning as with the previous rejection for the combination of Polyplastics with Kuduo.

Due to the similarity of the reasoning used by the Examiner to the reject these claims, the Applicants apply similar arguments in response. There is no motivation to combine the references as suggested by the Examiner. Therefore, it would not be obvious to combine the references and, even if so combined, the combination would not provide one of ordinary skill the presently claimed invention.

Claim 14 was rejected as obvious over Kosinski in view Kuduo further in view of US Pat. No. 3,813,212 to Shofner et al. ["Shofner"].

The Examiner contends that Shofner teaches to flame treat a thermoplastic polymer prior to lamination in order to improve adhesion, and that this teaching in combination with the previously described references obviates Claim 14. For the reasons discussed above, the combination of Kosinski and Kuduo does not disclose the claimed invention, and Shofner does not cure the stated deficiencies. The combination cannot support a *prima facie* case of obviousness and Applicants respectfully request reconsideration and withdrawal of the rejection.

Claim 1, 5, 7 and 9 were rejected under this provision as obvious over Jap. Pat. No. 2002309064 to Nakamura in view of Kosinski.

Nakamura is an English abstract of a Japanese patent. It discloses that its technical solution is to provide a composition comprising a polyoxymethylene resin, a styrene resin, a polycarbonate resin and a polyolefin resin having excellent dimensional stability, mechanical properties such as impact resistance and thermal stability and giving a molded article having excellent surface state. Kosinski is a U.S. patent having a technical solution to provide polyoxymethylene compositions "having increased elongation at break" (Kosinski, col. 1:37-38 and 43-46).

The technical solution of the present invention is to provide a substrate comprising polyoxymethylene and at least one non-acetal thermoplastic polymer in order to promote adhesion between the substrate and a layer adhered to it. To the point, the specification discusses that articles previously made from polyoxymethylene exhibit high stiffness, strength and solvent resistance, but because of their highly crystalline surface, they also have "low levels of adhesion". This makes it "difficult if not impossible to readily paint, glue, or print on such surfaces, overmold such articles with thermoplastic polymers or adhere some other type of layer to the surface of the substrate" (spec., page 1:27-32). Also, "polyoxymethylene based substrates have low levels of adhesion at their surface", which makes it difficult to fashion layered articles for commercial purposes (spec., page 2:32-35). Moreover, the examples and comparative examples (see Tables 1, 3, and 4) demonstrate that substrates comprising polyoxymethylene and at least one non-acetal thermoplastic polymer have significantly better adhesion to other materials than substrates comprising polyoxymethylene without at least one non-acetal thermoplastic polymer.

Neither Mura nor Kosinski suggests the recited and disclosed technical solution of the present invention, i.e., a polyoxymethylene blend substrate that promotes adhesion between the substrate and at least one layer adhered to it, thereby allowing application of a coating or paint, etc. (spec., pg. 1:13-15; claim 1). The motivation for putting together Kosinski with Mura could not have come from within the Kosinski-Mura combination but could only have arisen from a backwards application of the technical solution recited in the claims. In effect, Kosinski was glommed onto Mura to create a combination solely because Kosinski supplies an art reference that discloses laminating polyoxymethylene layers to other layers. Kosinski cannot and does not teach anything about an article that has enhanced adhesion between the polyoxymethylene substrate and a layer adhered to it, as recited in the claims.

Claims 1, 5-7 and 9-13 were rejected under 103(a) as obvious over Jap. Pat. No. 02027615 ["Gawa"] in view of Mura.

The Office Action asserts that even though Gawa does not teach that the polyoxymethylene layer should comprise the claimed composition, Gawa does teach a laminate of 2 insulating layers, the first of which comprises conductors and polyoxymethylene and the second layer comprises polyoxymethylene. Mura is asserted to teach a composition

Application No.: 10/723653
Docket No.: AD6924USNA

Page 6 of 6

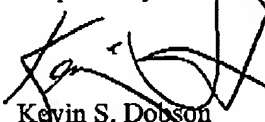
comprising 100 pbw polyoxymethylene and 0-100 pbw of a polycarbonate resin. The Office Action asserts that the substitution of the Mura resin for the polyoxymethylene taught in Gawa would be obvious, and that motivation for such substitution "would have been to improve the impact resistance, dimensional stability, and mechanical properties of said laminate.

As discussed above, the technical solution of the present invention is to provide a laminated substrate comprising polyoxymethylene and at least one non-acetal thermoplastic polymer to promote adhesion between the layers. Nothing in either Gawa or Mura individually or in combination relates to or teaches about improved adhesion of polyoxymethylene substrates. Moreover, the combination suggested by the Examiner has nothing to do with the invention as claimed, with its technical merits. The Applicants suggest that the Examiner is using hindsight reconstruction in an attempt to construct the Applicants' claimed invention from the references. There is no suggestion in either of the references for a combination motivated to improve surface adhesion. In fact, the Examiner continues to suggest that the motivation for combining the references is to improve properties that the Applicants have not even mentioned or measured in describing their own invention. The Examiner is reading the references into the Applicants' invention, another form of hindsight reconstruction that is surely impermissible.

The suggestion to combine the references must come from the references themselves, and must also provide the Applicants' claimed invention. The Examiner has not provided *prima facie* evidence that a POM composition as claimed by the Applicants would be obvious from the cited references. The Applicants therefore respectfully request that the Examiner reconsider the rejection and withdraw same in view of the Applicants' arguments.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,



Kevin S. Dobson
Registration No. 0,296
Telephone: 302.892.5526
Facsimile: 302.992.3257

Dated: October 16, 2006